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Euryischomyia Girault (Hymenoptera: Chalcidoidea: Aphelinidae: Eriaporinae: Euryischiini)

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Abstract.—Types of some Australian Euryischiini described by A. A. Girault have been examined, and compared with other material identified by Girault, together with other reared and collected material of *Euryischomyia* Girault. *Euryischomyia saintpierrei* Girault, 1915, syn. nov.; *Myiocnema marmorativentris* Girault, 1915, syn. nov.; *E. fasciata* Girault, 1916, syn. nov.; and *E. setosa* Girault, 1929, syn. nov.; are placed in synonymy with *E. flavithorax* Girault & Dodd, 1915; and *E. alami* Shafee, 1975, syn. nov., (described fom India), is placed in synonymy with *E. washingtoni* Girault, 1914. A key to the 2 remaining species of *Euryischomyia* is provided. *E. washingtoni* and *E. flavithorax* are redescribed. *E. washingtoni* is known as a parasite of pseudococcids, and *E. flavithorax* as a hyperparasite of psyllids, aphids, coccids and pseudococcids.

INTRODUCTION

The placement, status and composition of the subfamily Eriaporinae (Chalcidoidea: Aphelinidae) have long been a matter of uncertainty. The subfamily was erected in the family Aphelinidae by Ghesquière (1955). Members have been variously placed in the Aphelinidae (e.g. Ashmead 1900; Compere 1947; Ferrière 1965) and Elasmidae (e.g. Girault 1914; Smith and Compere 1928; Nikol'skaya 1963). Currently, the Eriaporinae are included in the Aphelinidae (e.g. Hayat 1994), albeit with some reservation (Goulet and Huber 1993). Contained taxa of Eriaporinae possess an unbroken, posteriorly expanded parastigma in the fore wing, which is usually continued posterobasally and bears 1–3 coarse, bristle-like setae.

Hayat and Verma (1980) created 2 tribes within the Eriaporinae, namely, the Eriaporini to contain the genera *Promuscidea* Girault and *Eunotiscus* Compere; and the Euryischini (*sic*) for 4 genera: *Euryischia* Riley, 1889; *Myiocnema* Ashmead, 1900; *Euryischomyia* Girault, 1914; and *Paramyiocnema* Girault, 1917. Euryischiini are characterised by possession of enlarged, compressed hind coxae, large, bristle-like setae on the legs and elsewhere, postaxillae, a wide scutellum and a large propodeum.

The nomenclatural history of the Euryischiini is complicated by the fact that Shafee (1974) had earlier erected the family Euryischidae (*sic*) to contain *Euryischia* and, subsequently, he included *Myiocnema* and *Euryischomyia* in the family also (Shafee 1975) but, later, Shafee and Rizvi (1990) retained only *Euryischia* in the family, transferring the other 2 genera to the Aphelinidae. The elevation of these genera to family status, and their separation, are not accepted herein.

Although *Euryischia* is well characterised, the limits of the other genera of Euryischiini have not been understood and their history is also confusing. Essentially, Girault (1914) described the new genus and species *Euryischomyia washingtoni* and, in 1917, erected the genus *Paramyiocnema* for *Myiocnema marmorativentris* Girault but did not describe or diagnose the genus. Girault (1930) placed *Euryischomyia* in synonymy with *Myiocnema*. Hayat and Verma (1980) transferred *Euryischomyia flavithorax*

Girault & Dodd to *Paramyiocnema.* They also opined that *E. saintpierrei* Girault, *E. fasciata* Girault and *E. setosa* Girault might also belong in *Paramyiocnema.* Shafee *et al.* (1985) placed *Paramyiocnema* in synonymy with *Myiocnema* and Hayat (1994) placed it in synonymy with *Euryischomyia.*

The types of *Euryischomyia washingtoni, E. flavithorax, E. saintpierrei, Myiocnema marmorativentris, E. fasciata,* and *E. setosa* have been examined by the author, together with other material identified by Girault, and more recently reared and collected material of *Euryischomyia.* As a result, *Euryischomyia saintpierrei, Myiocnema marmorativentris, E. fasciata,* and *E. setosa* are placed in synonymy with *E. flavithorax.*

In addition, *E. alami* Shafee, 1975, described from India, is proposed as a junior synonym of *E. washingtoni,* thus reducing *Euryischomyia* to 2 species, namely, *E. washingtoni* and *E. flavithorax.*

METHODS

All museum material was examined as provided, as dry-mounts, or as uncleared or cleared slide-mounts. Girault's material was recognizable from information provided by Dahms (1984, 1986), and by recognition of Girault's or Mrs E.J. Girault's handwriting on the labels.

Whenever feasible, reared material was obtained by caging live, field-collected material to allow maximal mummification of already-parasitized hosts. Aphid mummies (mummified, parchment-like, sometimes silk-lined, aphid skins containing immature parasites) were removed and placed individually in gelatin capsules. Except when slide-mounted, each emergent parasite was preserved in association with its mummy. Reared material was dry-mounted, or preserved in 80% ethanol, or cleared and slide-mounted using 10% potassium hydroxide, chloral-phenol, and gum-chloral mounting media.

Micrometer eyepieces were used for measurements, all of which are of maximal values; those of the scape do not include the radicle; those of the metasoma include the ovipositor. Length of mesosoma + metasoma is given rather than body length because the head of most of Girault's specimens is separated from the trunk and slide-mounted fronto-occipitally and, in those instances of two or more mountings per coverslip, head and trunk could not be matched with confidence.

Girault customarily enumerated the number of specimens he used in a description of a new species, and then implicitly designated only 1 or 2 types from that material. Dahms (1983) considered as types all specimens stated by Girault to have been used by him in a description. Dahms' practice is followed herein.

Dahms (1984, 1986) and Hayat and Verma (1980) catalogued Girault's material of *Euryischomyia* in detail, obviating the necessity to do so herein. The information contained in the lists of specimens examined has therefore been simplified. Where appropriate, label data are enclosed in quotation marks; added or interpreted information is enclosed in square brackets. Latitudes and longitudes have in most cases been provided by the author.

The terminology adopted is that of Naumann (1991), except for the following: Antennal formula: representation of the number of segments comprising, respectively, the scape, pedicel, anellus, funiculus, club. Postaxilla: a small triangular sclerite posterior to, and apparently a division of, the mesonotal axilla; a term proposed by Shafee (1975). Parastigmal spur: a posterobasally orientated extension of the parastigmal vein, bearing 1–3 stout, bristles.

Abbreviations used include the following: ANIC, Australian National Insect Collection, Canberra; BMNH, British Museum (Natural History), London; QM, Queensland Museum, Brisbane; SAM, South Australian Museum, Adelaide; USNM, United States National Museum of Natural History, Washington DC; WADA, Western Australian Department of Agriculture, South Perth; ZMA, Zoological Museum, Aligarh.

Euryischomyia Girault

Euryischomyia Girault, 1914: 285.—Girault 1915a: 178; Girault 1930: 1; Shafee 1975: 27; Hayat & Verma 1980: 35; Hayat 1983: 87; Dahms 1986: 689; Viggiani 1988: 101; Shafee & Rizvi 1990: 103.

Euryischomyiia [*sic*] Girault, 1929: 331.

Paramyiocnema Girault, 1917: 93.—Hayat 1994: 85.

Type species *Euryischomyia washingtoni* Girault, by monotypy and original designation.

The following characters, in combination, are diagnostic for *Euryischomyia*:

Head with 7 pairs of long, stiff setae near ocelli and inner orbital margins; maxillary and labial palps 2-segmented; mandibles tridentate (or, depending on interpretation, bidentate, the wide dorsal tooth being apically concave and truncate); setose. Antennae: scape unexpanded in both sexes; 1–2 anelli; funicle 3-segmented; club 3-segmented.

Pronotum with row of long, stiff setae, 3 on each side, posterosublaterally. Mesoscutum between notauli with 2–3 rows of shorter, finer setae anterior to row of 4 and row of 2 longer, stiffer setae; scutellum wider than long, with 2 pairs of long, stout setae, otherwise bare. Postaxillae present, bare. Phragma evenly tapered, apically incised. Metanotum not produced posteromedially. Propodeum wide, not excavated posterolaterally.

Fore wings hyaline or medially infuscated; parastigmal spur little- or well-developed, with 1–2, rarely 3, long, bristle-like setae of similar size to those on submarginal vein; 0–2 bristle-like setae posterobasal to parastigma, or area posterior to submarginal vein and proximal of parastigmal spur with 6–13 shorter, stiff setae in 2–3 irregular rows; this area of disc otherwise bare; discal setation proximally regularly or irregularly margined.

Legs: hind coxa enlarged, elongate-ovate, bilaterally compressed ventrally; hind femur elongate, broad, laterally compressed, laminose and arcuate in section; fore and mid femora also broad and laterally compressed. Only one hind tibial spur. Long, bristle-like setae on legs most commonly disposed in differently sized pairs (as subapically on coxae) or in longitudinal rows (as on mid and hind tibiae).

Petiole wide, boomerang-shaped. Bases of cerci low, tuberculate.

Notes.—*Euryischomyia* is most closely related to (the monotypic) *Myiocnema*, which differs in possessing 2 hind tibial spurs, 3-segmented maxillary palps, 3 anelli, and a distinctive fore wing chaetotaxy; the costal cell bears numerous short, stiff setae, and the basal discal area bears both a very long bristle-like seta posterior to the parastigmal spur and several irregular rows of shorter, stiff setae in the angle between the submarginal vein and the parastigmal spur. The chaetotactic differences may be of specific value only. Studies in progress by J.B. Woolley and M. Hayat show that *Myiocnema* differs significantly from *Euryischomyia* in not possessing a looped mesofurca (Hayat 1994).

Euryischia is very distinctive in possessing almost circular, disc-like hind coxae, a posterolaterally excavated propodeum to accommodate the coxae, and a posteromedial metanotal process ('elasmid' characteristics). *Euryischia* is further distinguishable from *Euryischomyia* in possessing 2 hind tibial spurs, 4-segmented maxillary palps, and cylindrical cercal bases. The scape of the male of some species of *Euryischia* is greatly enlarged, and the chaetotaxy of the mesonotum and fore wing of *Euryischia* is interspecifically variable. Hayat and Verma (1980) provided keys to the genera.

Taxa of Euryischiini clearly demonstrate different degrees of development of eriaporine and euryischiine features, namely, development of the parastigmal spur; spinosity of the legs, fore wing and body; enlargement and compression of the hind legs and concomitant modifications of the mesosoma. *Euryischia washingtoni, E. flavithorax, Myiocnema comperei* Ashmead and *Euryischia* spp. are successively more endowed in these respects.

KEY TO SPECIES OF *EURYISCHOMYIA* GIRAULT

1. Parastigmal spur well-developed, bearing 2, rarely 3, long, bristle-like setae. Area immediately posterior to submarginal vein and proximal to parastigmal spur with 2–3 irregular rows of 6–13 relatively small, stiff setae. Subapical margin of costal cell with 4–7 short, stiff setae anterior to cluster of fine, ventral setae; otherwise bare. Fore wings hyaline, not narrow. Mesoscutum with 11-21 setae in 2–3 irregular rows anterior to row of 4 and row of 2 bristle-like setae. Body coloration yellow, orange, brown and black. Distribution: Australia. . . . . *E. flavithorax* Girault
– Parastigmal spur scarcely developed, bearing 1–2 bristle-like setae. Area posterobasal to parastigma bearing 0–2 large, bristle-like setae. Costal cell ventro-subapically with some pale, fine setae; otherwise bare. Forewings narrow, 3.5 times longer than width; medially with broad band of infuscation. Mesoscutum with only 8 setae anterior to row of 4 and row of 2 setae. Body coloration predominantly black, legs predominantly lemon-yellow. Distribution: Australia and India. . . . . *E. washingtoni* Girault

Euryischomyia washingtoni Girault

Euryischomyia washingtoni Girault, 1914: 285.—Girault 1915a: 178; Hayat & Verma 1980: 37; Dahms 1986: 649.

Euryischomyia alami Shafee, 1975: 27.—Hayat & Verma 1980: 37. **Syn. nov.**

Type Material Examined.—*Euryischomyia washingtoni* Girault: Lectotype ♀, paralectotype ♂ (both on 1 slide, also parts of holotype of *Pleurotropomyia seditiosus* Girault; all separate); paralectotype ♀, (on tag, minus head). (QM 4060; [Hy]2742). QUEENSLAND: 20°32′S 145°24′E Capeville (Pentland), by sweeping in forest along the banks of Cape River, 8.i.1913 (Girault 1914).

Other Specimen Examined; Identified by A.A. Girault.—"*Euryischomyiia* [sic] *washingtoni*" ♀ (on tag and on slide; slide also contains a paratype of *Amicromelus grandaevus* Girault). QUEENSLAND: 17°23′S 145°19′E Watsonville (QM).

Other Records.—*Euryischomyia washingtoni*: QUEENSLAND: 19°15′S 146°48′E Townsville, sweeping in forest, 19.i.1913, ♀ (Girault 1915a).

Euryischomyia alami: *ex Nipaecoccus viridis* (Newstead) on *Mangifera indica*, MYSORE: Bangalore, Channapatna, 2.xii.1968, holotype ♀, paratype ♀, S.A. Shafee (Shafee 1975) (ZMA).

Euryischomyia alami: *ex Nipaecoccus viridis*, TAMIL NADU: Shencottah, 2♀♀, M. Hayat (Hayat and Verma 1980) (ZMA).

Redescription.—Coloration of ♀: Body shiny, blackish brown to black; mesonotum obscurely dark green metallic. Body setae mostly pale. Legs whitish except for following: fore coxae dusky basally; mid and hind coxae black except apically; mid and hind femora black except apically and basally; tarsi brown apically; sockets of hind tibial bristles black. Fore wings each with broad band of pale to dark infuscation extending from anterior to posterior margins in region of marginal and postmarginal veins, otherwise hyaline.

Morphology: Length mesosoma + metasoma: 0.90 mm (paralectotype ♀); 1.05 mm (lectotype ♀); 1.40 mm (♀ *ex* Watsonville); 0.84 mm (paralectotype ♂). All bristle-like setae smaller and finer than corresponding ones of *E. flavithorax.*

Head: submedian frontal setae (of ♂): (48μm); interocellar setae: (68) μm. Maxillary and labial palps longer and more slender than in *E. flavithorax*. Dorsalmost tooth of mandibles pointed.

Antennae of ♀ *ex* Watsonville (and ♂): antennal formula: 1:1:1–2:3:3; relatively longer and more slender than in *E. flavithorax*. Scape: length 5.56 (4.44) × maximal width; 1.82 (1.73) × length of pedicel; 1.22 (1.11) × length of club. Pedicel: 2.5 (2.28) × maximal width. Anellus small, wedge-shaped; a 2nd anellus may be partly delimited from it. Funicular segments mostly as long as or longer than wide; segment 1 (f1): length, 1.18 (1.0) × width; f2: length, 1.41 (0.94) × width; f3: length 1.04 (1.14) × width. Club: length: 2.56 (3.56) × width. Lengths of segments: scape, 150 (107) μm; pedicel, 83 (62) μm; f1: 30 (20) μm; f2: 47 (21) μm; f3: 41 (30)μm; club: 123 (96) μm.

Mesosoma of lectotype ♀ (and ♂): Pronotum: 6 bristle-like setae postero-sublaterally, 68 (75) μm long. Mesoscutum between notauli with row of 2, and row of 6, fine, bristle-like setae, 33 (26–29) μm long; row of 4 (38) μm long; and row of 2 thicker, bristle-like setae (51) μm long. 2 midsublateral and 2 posterolateral scutellar setae, (45 μm) and 90 (93) μm long, respectively. Axilla with 2 setae; posterior seta (34) μm long.

Legs of lectotype ♀ (and ♂): Hind coxa, 0.21 (0.22) mm long, 1.87 (1.74) × width, slightly shorter than hind femur, which is shorter than hind tibia; subapical setae of hind coxa: 30 (36) and 48 (54) μm long; hind femur, 0.23 (0.26) mm long, 2.53 (2.74) × width, subapical seta, 26 (30) μm; hind tibia, 0.31 mm long, gradually broadening apicad, preaxial row of setae maximally 50 μm long, subapical setae 44 and 62 μm long, spur 48 μm long.

Fore wings of lectotype ♀ (and ♂) narrow, 3.5 × width. Parastigmal spur hardly developed, bearing 1–2 bristle-like setae, 45 μm long; 1 or 2 bristle-like setae posterobasal of parastigma, 31 (35) μm and (18) μm long, respectively. Subapical area of costal cell devoid of marginal setae. Discal setation with regular margin.

Metasoma in dry-mounted ♀♀ upturned at an angle of approximately 60°, strongly tapered apicad.

Ovipositor sheaths 0.18 mm long, 0.59 × hind tibial length, slightly protrusive beyond apex of metasoma, densely and evenly furnished with short, bristle-like setae.

Notes.—Based on a knowledge of the chaetotactic variability within the tribe, *E. alami* is hereby placed in synonymy with *E. washingtoni*, despite the fact that the types of *E. alami* have not been seen by the present author. *E alami* reportedly differs from *E. washingtoni* in not bearing discal setae posterior to the parastigma, and in possessing 3 setae anteriorly on the axilla (Shafee 1975; Hayat and Verma 1980). These differences are too small to warrant separation at the species level. Hayat and Verma (1980), who studied the above-listed specimens from Tamil Nadu, are also of the opinion that the differences between the 2 taxa appear to be of doubtful specific value.

The above description of *E. washingtoni* supplements those of Girault (1914, 1915a) and Hayat and Verma (1980) of *E. washingtoni* and that of Shafee (1975) of *E. alami*. Because of the paucity and poor condition of the material available for study, a composite and comparative method of description is adopted. *E. flavithorax*, the standard of comparison, is conventionally described below in greater detail. The lemon yellow coloration described by Girault (1914, 1915a) can be presumed to have faded with time to white. The antenna of the paralectotype ♀ (on slide) is compressed; measurements and ratios of the ♀ *ex* Watsonville are given instead.

E. washingtoni has less developed euryischiine features than the other taxa of Euryischiini, having a scarcely developed parastigmal spur, and shorter, finer bristle-like setae on the body, limbs and fore wings.

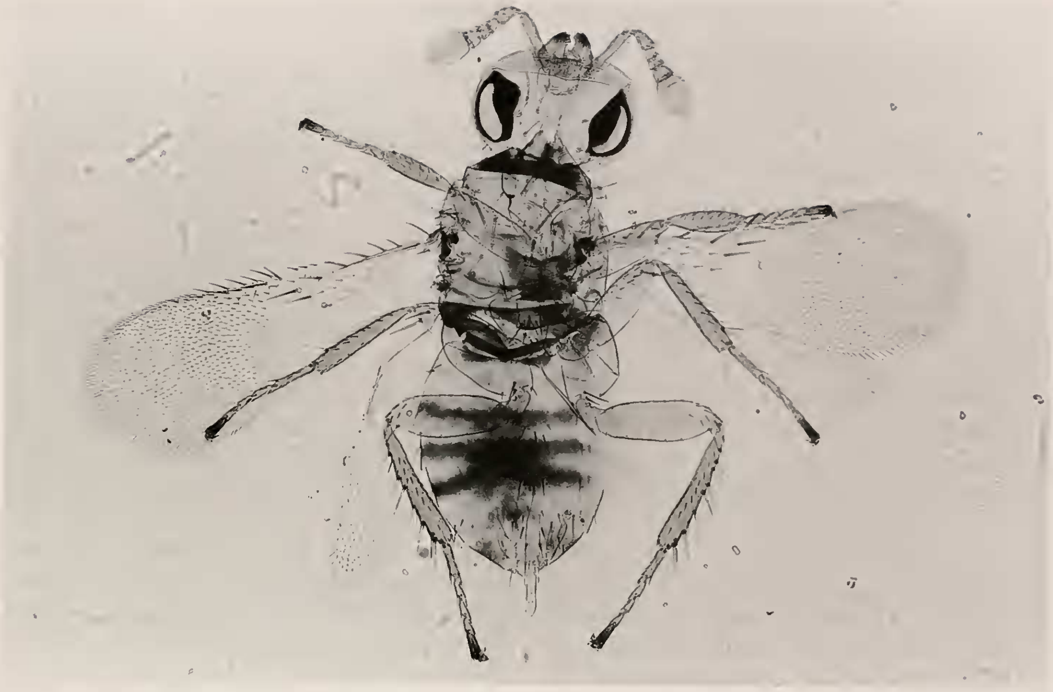

Fig. 1. *Euryischomyia flavithorax*, male (×67). Cleared, slide-mounted specimen.

Biology.—Parasite of unknown status of *Nipaecoccus viridis*, Pseudococcidae.

Distribution.—AUSTRALIA: Queensland; possibly also Beenleigh, Victoria (Viggiani 1988); INDIA: Mysore, Tamil Nadu.

Euryischomyia flavithorax
Girault & Dodd
(Figure 1)

Euryischomyia flavithorax Girault & Dodd, 1915 in Girault 1915a: 178.—Dahms 1984: 614.

Euryischomyia saintpierrei Girault, 1915a: 178.—Hayat & Verma 1980: 37; Dahms 1986: 495. **Syn. nov.**

Myiocnema marmorativentris Girault, 1915b: 64.—Dahms 1984: 795. **Syn. nov.**

Euryischomyia fasciata Girault, 1916: 212.—Hayat & Verma 1980: 37; Dahms 1984: 579. **Syn. nov.**

Paramyiocnema marmorativentris (Girault).—Girault 1917: 93; Hayat & Verma 1980: 35.

Euryischomyi[*i*]*a setosa* Girault, 1929: 331.—Hayat & Verma 1980: 37; Dahms 1986: 522. **Syn. nov.**

Paramyiocnema flavithorax (Girault & Dodd).—Hayat & Verma 1980: 33.

Type Material Examined.—*Euryischomyia flavithorax* Girault & Dodd: Lectotype ♀ (on slide); paralectotype ♀ (on tag; head and hind tibia on same slide as lectotype, herein called paralectotype 1); paralectotype ♀ (also on same slide as lectotype, herein called paralectotype 2). QUEENSLAND: 17°05′S 145°47′E "Gordonvale (Cairns)" (QM 3903; Hy2744).

Euryischomyia saintpierrei Girault: Holotype ♀ (torso and 1 fore wing on tag, fore wing separate, not listed by Dahms (1986); head, funicular segments 2 and 3 and club, both hind legs on slide) (QM 3905; Hy2743). QUEENSLAND: 27°28′S 153°02′E Brisbane (Girault 1915a).

Myiocnema marmorativentris Girault: Holotype ♀ (on slide) QUEENSLAND: 17°05′S 145°47′E "Gordonvale (Cairns)" (QM 3907; Hy2959).

Euryischomyia fasciata Girault: Holotype

♂ (not ♀, as described by Girault; on tag minus antennae, right wings and leg parts; antenna minus scape, fore wing, hind femur and hind tibia on slide; antenna not listed by Dahms (1984)). WESTERN AUSTRALIA: 31°57'S 115°51'E "Perth, W. Austr., G. Compere, Collector, 837" (USNM 19679).

Euryischomyiia [*sic*] *setosa* Girault: Holotype ♀ (on tag, minus head, with 1 fore wing on slide) SOUTH AUSTRALIA: 32°49'S 138°11'E "Melrose, Oct., A.M. Lea" (SAM).

Other Specimens Examined: identified, as follows, by A.A. Girault.—"*Myiocnema flavithorax* Gir. [*sic*], brown scale [*Coccus hesperidum*] parasites, [WESTERN AUSTRALIA:] ♀, [2]♂♂, coll. L.J. Newman, 70". (On 1 slide. Host identified as *Coccus hesperidum* in F. Wilson (1960)). (WADA).

Euryischomyiia [*sic*] *flavithorax* Gir. [*sic*], ♀. Host Lecanidae [Coccidae] sp. Ent. Div. Dep. Ag. & Stk Qld." (QM Hy 10).

"*Myiocnema saintpierrei* Gir., ♂, ♀. Host *Saissetia* sp., Sydney [33°53'S 151°12'E], N.S.W., June 19–31, S.E. Flanders. Univ. Cal. Citrus Exp. Sta. Acc. No. 27)." (On slide; only 2 of 6 specimens easily observable). (QM).

"*Myiocnema setosa* Gir., ♀, *Myiocnema saintpierrei* Gir., ♂, ♀, on lime scale [Coccidae?], [QUEENSLAND: 26°45'S 150°38'E] Chinchilla, Aug. 14, 1931, S.E. Flanders". (On slide; only 2♀♀, 2♂♂ easily observable) (QM).

Other Specimens Examined.—QUEENSLAND: 15°39'S 144°31'E Split Rock, 28.v.–26.vi.1993, ♀, P. Zborowski, I.D. Naumann (ANIC).

WESTERN AUSTRALIA: 33°45'S 122°32'E Condingup, 55km E of Esperance, 30.xii.1986, ♂, J.S. Noyes (BMNH).

ex Psyllaephagus sp. / *Cardiaspina albitextura* Taylor on *Eucalyptus blakelyi*, VICTORIA: nr 36°21'S 146°19'E Wangaratta, 11.ii.1955, 3♀♀, 7♂♂, E. Lewis (ANIC).

ex Cardiaspina sp. on *Eucalyptus blakelyi*, AUSTRALIAN CAPITAL TERRITORY: 35°18'S 149°08'E Canberra (site 15a), 3.ii.1954, 2♀♀, A. Magassy. NEW SOUTH WALES: 35°50'S 147°15'E Woomargana, 3.xii.1954, ♀, E. Lewis (all in ANIC).

ex Creiis sp., WESTERN AUSTRALIA: 31°59'S 115°52'E Western Australian Institute of Technology, South Perth, 1982, ♀, S.J. Curry (ANIC).

ex Aphidius colemani Viereck / *Brachycaudus helichrysi* (Kaltenbach) on safflower, NEW SOUTH WALES: 29°14'S 149°51'E 25km N. of Moree, 12.ix.1993, 3♀♀, 1♂, J. Stanley (ANIC).

ex Aphidius colemani / *Myzus persicae* (Sulzer) on nectarine, AUSTRALIAN CAPITAL TERRITORY: 35°15'S 149°05'E Aranda, Canberra, 15.xi.1991, 2♀♀, P.J. Hart (ANIC).

ex Trioxys complanatus Quilis / *Therioaphis trifolii* (Monell) f. maculata on lucerne, VICTORIA: 36°25'S 145°56'E Goorambat, 1979, ♀, P. Ridland; 36°33'S 145°59'E Benalla, 9.ii.1978, ♀, 2♂♂, L.T. Woolcock; SOUTH AUSTRALIA: 34°40'S 138°34'E Virginia, 21.ii.1980, ♂, C. Wilson; 34°56'S 138°36'E Northfield, Adelaide, 20.iii.1978, 8.ii.1979, 4♀♀, 3♂♂, L.T. Woolcock; 35°41'S 139°20'E Meningie, 27.ii.1979, ♂, C. Wilson (all in ANIC).

ex Aphelinus mali (Haldeman) / *Eriosoma lanigerum* (Hausmann) on apple, NEW SOUTH WALES: 30°31'S 151°40'E Armidale, December 1992, 6♀♀, S. Asante (ANIC).

ex Pseudococcus sp., on *Acacia melanoxylon*, VICTORIA: 37°42'S 145°04'E LaTrobe University, Bundoora, Melbourne, 1.xii.-1980, 2♀♀, 2♂♂, G. Farrell (BMNH).

Other records.—QUEENSLAND: 15°28'S 145°15'E Cooktown, in forest, 2.iii.1914, ♀, A.P. Dodd (Girault 1915a; Dahms 1984).

WESTERN AUSTRALIA: 27°41'S 114°33'E Kalbarri National Park, December 1986, ♀, J.S. Noyes; 31°36'S 116°13'E Avon Valley National Park, 50km NE of Perth, 25.xii.1986, ♀, J.S. Noyes; 31°43'S 116°04'E Walyunga National Park, 40km NE of Perth, 24.xii.1986, ♂, J.S. Noyes (BMNH) (Identified by L.D. Coote).

ex Ceroplastes rubens Maskell on *Schef-*

flera actinophylla, QUEENSLAND: 27°30′S 153°01′E Brisbane, May 1980, 4♂♂, J.S. Noyes (BMNH) (Recorded as *Paramyiocnema* sp. by Viggiani (1988)).

Redescription of Female.—Coloration: Most body setae dark. Head yellow, orange or tawny except for following: brown, linear macula suborbitally on gena; small, brown macula surrounding posterior half of median ocellus and anterior half of each lateral ocellus; extensive, broad, brown to black, inverted U-shaped macula in region adjacent to prothorax; mandibles apically testaceous. Antennae yellow, scape may be dusky. Eyes red; margin and, internally, medial half of eye socket darkly sclerotized (conspicuous only in cleared specimens). Ocelli red.

Mesosoma, orange or tawny except for following dark sclerotization: extensive, brown to black macula on prothorax adjacent to occipital region of head; notauli anteriorly, boundaries of anterior angles of axillae, anterior and posterior boundaries of pronotum, scutellum and metanotum may be brown; 1–2 small, brown to black maculae near base of fore wing; sometimes 1 macula at base of posterolateral setae of scutellum and submarginally on metanotum; propodeum light to dark brown anteriorly and on each lateral third except for spiracles, lateral margins may be darker, or whole segment may be brown and laterally black. Ventrally and sometimes pleurally, mesosoma light brown to dark brown.

Legs yellow except for following: fore femur with linear macula postaxially; mid coxa may be slightly dusky basally; hind coxa brown to dark brown except usually apically, sometimes also dark brown marginally; hind femur sometimes streakily dusky; sockets of hind tibial bristles black.

Metasoma light brown to black; petiole usually brown, often black on lateral margins; base of gaster medially and gastral tergites 2–4 usually darker than rest of gaster, and fasciate, especially under high magnification.

Morphology: Length mesosoma + metasoma, 0.7–1.3 mm long (mean, 1.01 mm; *n*=20; lectotype, 1.06 mm). Integument variously reticulate-imbricate, except that of most of metanotum and propodeum, which is smooth; imbrication on tibiae finely setose at interstices. Large setae longitudinally ridged.

Head: 2 pairs of large, stiff, bristle-like setae on frons near margins of eyes; 1 submedian pair between these (100μm long in lectotype); 1 pair lateral to median ocellus; 1 pair near margin of eyes anterolateral to lateral ocelli; 1 pair between lateral ocelli (113 μm); 1 pair posteromedial to lateral ocelli. Dorsalmost tooth of mandible usually slightly blunt.

Antennae inserted not far distant from clypeal margin, the distance subequal to distance between insertions; setae short, with stouter, stiffer hairs concentrated on one side; antennal formula: 1:1:1–2:3:3. Scape: length, 2.9–3.4 × width (mean, 3.2); 1.7–2.3 (2) × length of pedicel; 1–1.2 (1.1) × length of club. Pedicel: length, 1.3–2.5 (1.8) × width; 0.6–1 (0.75) × length of anellus(i) + funicle. Anellus 1 large enough to be considered funicular, finely setose but non-sensoriated; a 2nd, very small, anellus sometimes variously developed on half of apex of anellus 1, may be setose. Funicular segments all wider than long, becoming progressively wider and longer apicad; segment 1 (f1) length, 0.58–0.87 (0.7) × width; f2: length, 0.47–0.82 (0.74) × width; f3: length, 0.64–0.9 (0.79) × width; length of anellus (i) + funicle, 0.6–0.9 (0.7) × club. Club 3-segmented; segments separable by segmentally arranged setal and sensorial patterns, not by sutures; length, 1.5–2.7 (2) × width; width 1–1.8 × width of f3. Lengths of segments: scape, 99–135 μm (mean, 117 μm; *n*=20); pedicel, 45–68 (58) μm; f1, 14–24 (17.5) μm; f2, 12–37 (24) μm; f3, 24–41 (31) μm; club, 93–123 (107) μm.

Mesosoma: Pronotum with row of 3+3 long setae (115 μm long in lectotype) posterosublaterally. Mesoscutum anteriorly, between notauli, with 11–21 fine, stiff setae (41 μm) in 2–3 irregular rows ; a middle transverse row of 4 long, stout setae (98 μm), and posterior row of 2 long, stout setae (90 μm). Scutellum with 2 long setae anterosublateral of midpoint (87 μm) and 2 very long, stout setae posterolaterally (168 μm). Axillae each with long, stout seta (84 μm) anteriorly and 2–3, rarely 4, shorter, differently sized setae (26–36 μm) near posterior angle. Mesosomal setae of smaller specimens shorter and less stout.

Legs bearing long, stiff setae, mostly in rows or in differently sized pairs; other setae mostly disposed dorsoapically on femur and longitudinally on tibia; Fore coxa (of 1 Northfield specimen): pair of long, stiff setae subapically (39 and 57 μm long); fore femur: subapically, 1 seta ventrally (29μm), 1 dorsally (45 μm); fore tibia appearing fusiform, calcar plumose (57 μm), 3 small, stiff setae apically (31μm), and row of 7 setae (maximally 31 μm) preaxially. Mid coxa: pair of setae subapically (42 and 57 μm); mid femur: very long pair subapically (65 μm ventrally, 78 μm dorsally); mid tibia: spur long (87 μm), plumose, 1 smaller seta near spur (18 μm), 1 subapically (53 μm), preaxial row (maximally 32 μm) hardly differentiated from other setal rows. Hind coxa (0.22 mm long), shorter than hind femur (0.28 mm), which is slightly shorter than hind tibia (0.32 mm) and subequal to hind tarsus (0.27 mm); hind coxa large, elongate-ovate, length 1.44–1.69 × width, bilaterally compressed ventrally, pair of setae subapically (44 and 66 μm); hind femur broad, approximately parallel-sided, length 2.83–3.14 × width, 1 seta subapically (58 μm); hind tibia, basally narrow, gradually and slightly widening apicad, spur almost smooth (54 μm long), pair of very long, stout setae subapically (68 and 89 μm) and 1 longitudinal row of 8 very long, stout setae (maximally 75 μm). Mid basitarsus longer than fore or mid basitarsus, but not conspicuously long.

Fore wings: 6–13 (mean, 10) moderately long and fine, stiff setae (30–40 μm long in 1 Northfield specimen) present in 2–3 rows below submarginal vein and proximal of parastigmal spur; 2–3 parastigmal setae (70–76 μm); costal cell in distal third with 4–7 short, stiff, marginal setae (25 μm) anterior to cluster of fine, stiff, ventral setae; margin of discal setation irregular.

Metasoma not upturned or strongly tapered: Petiole boomerang-shaped except for truncated ends. Variously sized, stiff setae metamerically disposed laterad and apicad on dorsum of gaster.

Ovipositor sheaths 0.10–0.11 mm long, 0.23–0.33 × hind tibial length, each furnished with about 10 mostly subapical setae.

Description of Male.—Similar to female. Colour pattern similar but yellower because of less extensive dark sclerotization. Linear macula usually present, anteromedially, on vertex; suborbital, linear macula of gena absent and U-shaped macula of occipital region absent. Mesosoma laterally pale. Gaster: dark sclerotization confined to narrow area adjacent to petiole and to medially coalesced fascia on gastral tergites 2–4, extending medially on gastral tergite 5 and apicolaterad.

Antennae (1 specimen): scape: length, 111 μm, 3.7 x width, 2.18 × length of pedicel, 1.19 × length of club; pedicel: length, 51μm, 1.7 × width, 0.71 × length of anellus + funicle; funicular segment 1 (f1): length, 12μm, 0.47 × width; f2: length, 21μm, 0.66 × width; f3: length, 27 μm, 0.66 × width; anellus + funicle: length, 0.77 × length of club; club: length, 0.93 μm, 1.32 × width.

Hind coxa 0.24 mm long, twice as long as wide; hind femur 0.24 mm long, 3.2 × width; hind tibia 0.3 mm long.

Mesosoma + metasoma 0.9 mm long. Anterior mesoscutal setae, 33–45 μm long; mid and posterior setae, 70 and 81 μm long respectively. Anterior and posterior scutellar setae 64 and 121 μm, respectively; only 1 posterior axillar seta, 24 μm long.

Notes.—The type material of *E. flavithor-*

ax comprises the slide-mounted lectotype designated by Hayat in 1979 (Hayat and Verma 1980), and paralectotype 1, with parts on a tag and parts on the same slide as the lectotype but mounted separately, inbetween the lectotype and paralectotype 2 (see list of type material examined). Paralectotype 2 is the specimen stated by Hayat and Verma (1980) to be a species different from the lectotype, resembling *marmorativentris*, and probably not part of the original type material. Consequent upon the above statements, the specimen was referred to by Dahms (1984) as an unidentified chalcidoid. Paralectotype 2 is, without doubt, *Euryischomyia flavithorax*. Smaller and yellower than the lectotype, it does indeed resemble the holotype *Myiocnema marmorativentris*, which was collected in the same locality a week or so later.

The female collected by A.P. Dodd at Cooktown has still not been located (see list of other records above). It may be part of Dodd's collection.

E. flavithorax was originally described from 3 swept specimens, and each of the synonymized species was described from single specimens. The relevant parts of the descriptions are based mainly on coloration. Other characters described by Girault are supra-specific or are not interspecifically comparable. However, all of them fit into the above conception of *E. flavithorax*.

E. flavithorax is variable in coloration. In general, smaller females are yellower and less darkly sclerotized than larger ones, and males are smaller and yellower than females. The differences are a reflection of differences in extent of dark sclerotization. The pattern of coloration, however, is constant, and is best expressed in the lighter-coloured specimens. The lectotype of *E. flavithorax*, for instance, belongs near the large, dark end of the scale of variability, whereas paralectotype 2 of *E. flavithorax* and the holotype *M. marmorativentris* belong near the small, pale end. The small, pale holotype *E. fasciata* is a male.

Girault (1915a) described *E. saintpierrei* as possessing 2 anelli, which may have been the reason why he considered it a species distinct from the other species of *Euryischomyia*, and why he identified specimens from 'lime scale' as 2 species, *M. saintpierrei* and *M. setosa* (see above list of specimens identified by Girault). These specimens, on 1 slide, have antennae each with either 1 or 2 anelli but are otherwise similar to one another. Most of the specimens of *E. flavithorax* examined in this study have both antennae with 1 anellus; others have 2; or 1 antenna may bear 1 anellus and the other bear 2; or 1 small anellus may be partly delimited from a larger one.

Distribution.—AUSTRALIA: Queensland, New South Wales, Australian Capital Territory, Victoria, South Australia, Western Australia (Figure 2).

Biology.—*E. flavithorax* is not highly host-specific, its recorded hosts being chalcidoid and ichneumonoid Hymenoptera, and psylloid, aphidoid and coccoid Hemiptera Sternorrhyncha (Table 1). *E. flavithorax* was reared occasionally from immature Aphidiinae and *Aphelinus mali*, endoparasitic in aphidine and drepanosiphine, and pemphigine aphids, respectively, as part of a long-term study by the author of aphids and their insect natural enemies; and, also occasionally, from *Psyllaephagus* sp(p). parasitic in lerp-forming psyllid nymphs, as part of an ecological study by L.R. Clark in 1950–74 of psyllids associated with eucalypts (Riek 1962).

E. flavithorax, however, is not a true hyperparasite of aphids if, like certain other chalcidoids and proctotrupoids (*e.g. Pachyneuron* spp. (Pteromalidae) and *Dendrocerus* spp. (Megaspilidae) (Takada 1973a,b)), it does not parasitize the hymenopterous host until after the latter has consumed all of its aphid host except for the dead, dry aphid skin (mummy); *i.e.* if it parasitizes the hymenopterous contents of a capsule it is strictly a primary parasite. Such a probability is supported by its broad host spectrum; parasitizing live hosts of such

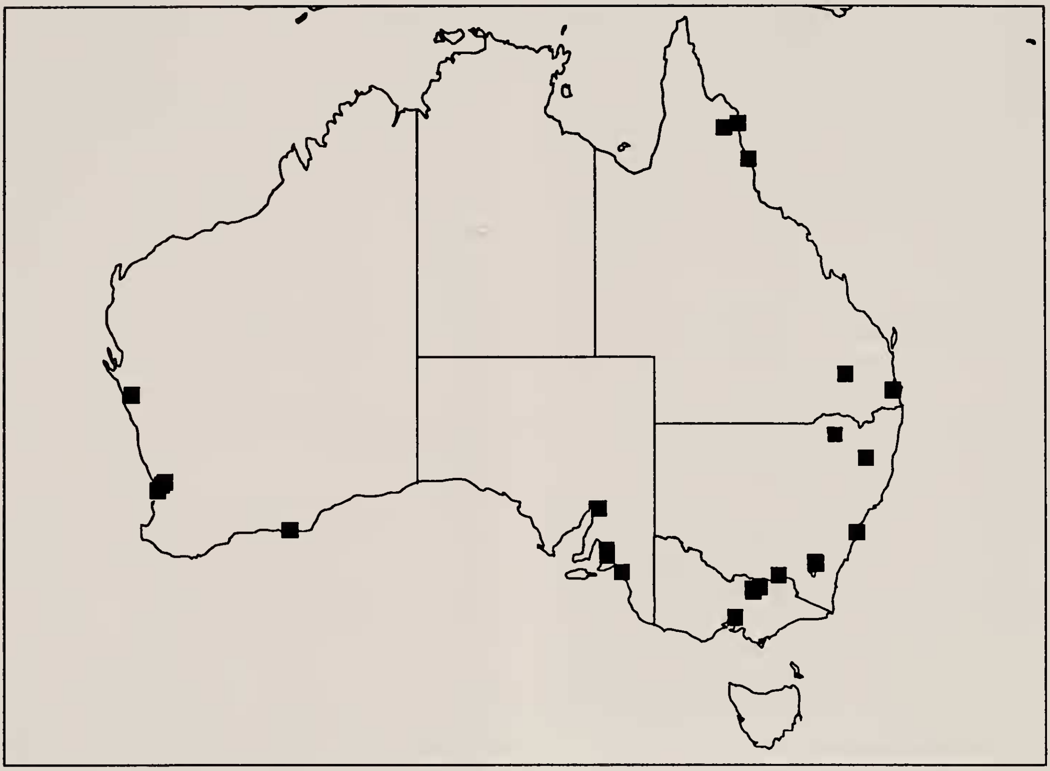

Fig. 2. Known distribution of *Euryischomyia flavithorax.*

Table 1. Hosts of *Euryischomyia flavithorax*

Hemiptera: Sternorrhyncha	Hymenoptera
Psylloidea: Psyllidae:	Chalcidoidea: Encyrtidae:
Spondyliaspidinae: *Cardiaspina albitextura*	*Psyllaephagus* sp.
Cardiaspina sp.	
Creiis sp.	
Aphidoidea: Aphididae:	Ichneumonoidea: Braconidae:
Aphidinae: *Brachycaudus helichrysi*	Aphidiinae: *Aphidius colemani*
Myzus persicae	*Aphidius colemani*
Drepanosiphinae: *Therioaphis trifolii* f. maculata	*Trioxys complanatus*
	Chalcidoidea: Aphelinidae:
Pemphiginae: *Eriosoma lanigerum*	*Aphelinus mali*
Coccoidea: Pseudococcidae:	
Pseudococcus sp.	
Coccoidea: Coccidae:	
Ceroplastes rubens	
Coccus hesperidum	
Saissetia sp.	

morphological and behavioral diversity would demand a high degree of reproductive adaptability.

Its status as a parasite of Coccoidea is uncertain. Female coccids, being sessile and capsule-like, could conceivably function as either primary or secondary hosts.

E. flavithorax is exclusively Australian, as far as known. The original hosts are likely to be native sternorrhynchous Hemiptera and Hymenoptera, *e.g.* spondyliaspidine psyllids and their *Psyllaephagus* parasites. The recorded aphid hosts and their primary parasites, and the coccoid hosts, are all exotic species introduced into Australia.

E. flavithorax was collected throughout the year but most commonly in summer (December and February). *E. flavithorax* (recorded as *Myiocnema* sp.) comprised 2% of the emergent parasites of *Trioxys complanatus* / *Therioaphis trifolii* f. maculata in several sites in South Australia between 1977 and 1980 (C.G. Wilson and Swincer 1984).

Females were commoner than males, especially among collected rather than reared material.

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